

What is claimed is:

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1. A transgenic system for purification of a target polypeptide having a bindable epitope, the system comprising:
- a transgenic animal having in its genome a nucleic acid encoding a multivalent binding polypeptide under control of a promoter which directs expression in mammary epithelial cells, wherein the multivalent binding polypeptide comprises a first binding moiety which specifically binds the bindable epitope of the target polypeptide and a second binding moiety which specifically binds a matrix, whereby such transgenic multivalent binding
- 10 polypeptide is expressed at high levels in milk of the transgenic animal; and
- a matrix to which the second binding moiety of the multivalent binding polypeptide specifically binds.
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2. The system according to claim 1, wherein the bindable epitope of the target polypeptide is removable.
3. The system according to claim 2, wherein the binding moiety of the multivalent binding polypeptide removes the bindable epitope.
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4. The system according to claim 2, wherein the system further comprises:
- a second transgenic multivalent binding polypeptide comprising a first catalytic domain and a second binding moiety which specifically binds a matrix, wherein the catalytic domain is capable of removing the bindable epitope of the target polypeptide; and
- 25 a second matrix which specifically binds the second binding moiety of the second transgenic multivalent binding polypeptide, wherein the matrix is different than the matrix specifically bound by the second binding moiety of the first transgenic multivalent binding polypeptide.
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5. A method of obtaining a target polypeptide having a bindable epitope from a product, the method comprising:

contacting a product which comprises a target polypeptide having a bindable epitope with a transgenic multivalent binding polypeptide, wherein the multivalent binding polypeptide comprises a first binding moiety which specifically binds the bindable epitope of the target polypeptide and a second binding moiety which specifically binds a matrix, to thereby provide a reaction mixture;

contacting the reaction mixture with a matrix which specifically binds the second binding moiety of the multivalent binding polypeptide; and

removing reaction mixture which does not bind to the matrix, thereby obtain the target polypeptide.

6. The method according to claim 5, further comprising eluting the target polypeptide from the matrix.

7. The method according to claim 5, wherein the product is milk.

8. The method according to claim 5, wherein the target polypeptide is an antibody.

9. The method according to claim 8, wherein the first binding moiety of the transgenic multivalent binding polypeptide is protein L or a fragment thereof.

10. The method according to claim 9, wherein the second binding moiety of the transgenic multivalent binding polypeptide is a cellulose bind domain (CBD) or a fragment thereof.

11. A multiple animal transgenic system for obtaining a target polypeptide having a bindable epitope, the system comprising:

a first transgenic animal having in its genome a nucleic acid encoding a multivalent binding polypeptide under control of a promoter which directs expression in mammary epithelial cells, wherein the multivalent binding polypeptide comprises a first binding moiety which specifically binds the bindable epitope of the target polypeptide and a second binding

moiety which specifically binds a matrix, whereby such transgenic multivalent binding polypeptide is expressed at high levels in milk of the transgenic animal;

a second transgenic animal having in its genome a nucleic acid encoding a target polypeptide under control of a promoter which directs expression in mammary epithelial cells; and

a matrix to which the second binding moiety of the multivalent binding polypeptide specifically binds.

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12. A method of obtaining a target polypeptide having a bindable epitope from milk, the method comprising:

contacting milk which comprises a target polypeptide having a bindable epitope with a transgenic multivalent binding polypeptide, wherein the multivalent binding polypeptide comprises a first binding moiety which specifically binds the bindable epitope of the target polypeptide and a second binding moiety which specifically binds a matrix, to thereby provide a reaction mixture;

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contacting the reaction mixture with a matrix which specifically binds the second binding moiety of the multivalent binding polypeptide; and

removing reaction mixture which does not bind to the matrix, thereby obtain the target polypeptide.

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13. The method according to claim 12, further comprising eluting the target polypeptide from the matrix.

14. The method of claim 12, wherein the target polypeptide is a transgenically produced polypeptide.

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15. The method according to claim 12, wherein the transgenic multivalent binding polypeptide is present in milk from another transgenic animal.

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16. A transgenic animal having in its genome a nucleic acid encoding a target polypeptide having a bindable epitope under control of a promoter which directs expression

in mammary epithelial cells, and a nucleic acid encoding a multivalent binding polypeptide under control of a promoter which directs expression in mammary epithelial cells, wherein the multivalent binding polypeptide comprises a first binding moiety which specifically binds a bindable epitope of a target polypeptide and a second binding moiety which specifically binds a matrix.

17. A method of obtaining a target polypeptide having a bindable epitope, the method comprising:

providing milk from a transgenic animal of claim 16;

contacting the milk with a matrix which specifically binds the second binding moiety of the multivalent binding polypeptide; and

removing any portion of the milk which does not bind to the matrix, thereby obtain the target polypeptide.

18. The method of claim 17, further comprising eluting the target polypeptide from the matrix.

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